

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants:	David J. Glova, <i>et al.</i>	§	
		§	Group Art Unit: 1793
Serial No.	10/799,987	§	
		§	Examiner: Edward M. Johnson
Filed:	March 12, 2004	§	
		§	Confirmation: 8787
For:	A METHOD OF TREATING A CATALYTIC	§	
	REACTOR SYSTEM PRIOR TO REACTOR	§	
	SERVICING	§	

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF EFS-WEB FILING

Pursuant to 37 C.F.R. §1.8, I hereby certify that this correspondence is being electronically submitted to the U.S. Patent and Trademark Office website, www.uspto.gov, on

2/16/2009
Ellen Anderson
Ellen Anderson

APPEAL BRIEF

Dear Sir:

This Appeal Brief is filed in support of the appeal in the above referenced application and is filed pursuant to the Notice of Appeal filed December 15, 2008. The Appellants authorize all required fees under 37 C.F.R. § 1.17 to be charged to Deposit Account No. 50-1515, of Conley Rose, P.C. of Texas.

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I. REAL PARTY IN INTEREST

The real party in interest in the instant application is the following party: Chevron Phillips Chemical Company, LP.

II. RELATED APPEALS AND INTERFERENCES

None.

III. STATUS OF CLAIMS

A. Total Number of Claims in the Application

Claims in the application: 1-33.

B. Status of All Claims in the Application

1. Claims canceled: None.
2. Claims withdrawn from consideration but not canceled: None.
3. Claims pending: 1-33.
4. Claims allowed: None.
5. Claims rejected: 1-33.
6. Claims neither rejected nor allowed: None.

C. Claims on Appeal

Claims on appeal: 1-33.

IV. STATUS OF AMENDMENTS

No amendments were filed after the October 16, 2008 Final Office Action (*Office Action*).

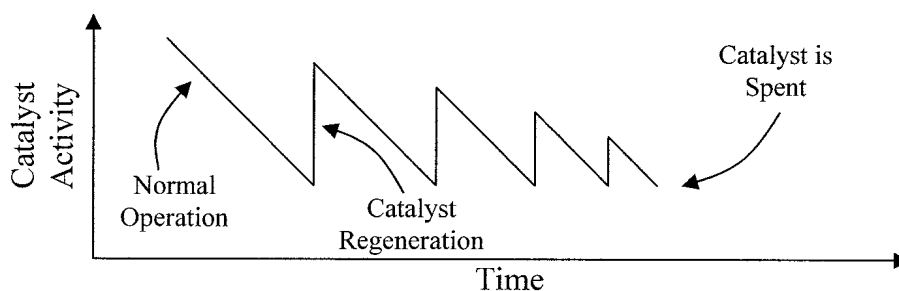
V. SUMMARY OF THE CLAIMED SUBJECT MATTER

This section provides a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by paragraph and line number.¹ Each element of the claims is identified with a corresponding reference to the specification where applicable. The citation to passages in the specification for each claim element does not imply that the limitations from the specification should be read into the corresponding claim element.

Catalytic reactor systems are widely used in a variety of industries. As these systems operate, the catalyst activity generally decreases over time, for example due to accumulation of coke or other byproducts that clog the catalyst pores. When the catalyst activity falls below an acceptable level, the catalyst can usually be regenerated using thermal regeneration. Unfortunately, each regeneration cycle is typically unable to return the catalyst to its full activity level. For example, the regenerated catalyst activity may be 90% of the catalyst activity after the previous regeneration cycle. As such, the catalyst reaches its minimum acceptable activity in progressively less time after each regeneration cycle until it is no longer economical to regenerate the catalyst. At such time, the catalyst is considered spent and must be replaced. Such a catalyst life cycle may be illustrated by the following figure:²

¹ 37 C.F.R. § 41.37 (c)(1)(v) provides that the “[s]ummary of claimed subject matter ... shall refer to the specification by page and line number.” The instant application was presented in numbered paragraph form. As such, the citations to the specification will be presented in the following form: Application at ¶ ____ (paragraph number), lines ____ (lines within the corresponding paragraph). On the occasion where the pertinent paragraph is contained on multiple pages, the paragraph line numbering will carry over to the subsequent page.

² In many catalytic reactors, the process is operated to produce a specified conversion rate or product purity. In such cases, there is generally an inverse relationship between catalyst activity and the inlet temperature required to maintain the specified conversion. Thus, the Appellants’ FIG. 1 is an inverted version of the figure presented herein.



The catalytic reactor may require service, e.g. maintenance, at various points throughout the catalyst life cycle. In preparation for the service, any hazardous substances present in the reactor system must be abated to a safe exposure level so that humans can enter the reactor. Typically, a catalytic reactor system regeneration procedure is performed to abate the hazardous substances to a safe exposure level, and subsequently a new catalyst activity cycle is begun after the servicing. However, if the catalyst is not at its minimum acceptable activity when servicing is needed, useable catalyst activity is lost during the regeneration.

The Appellants have invented a process by which a catalytic reactor can be made safe for servicing without having to perform a catalytic regeneration. Specifically, any hazardous substances within the reactor can be abated via exposure to a low heat, low oxygen environment for less time than is required for catalyst regeneration. Such abatement does not substantially affect the catalyst activity, and thus when the service is completed, the catalyst has substantially the same position on the above figure as it had prior to the servicing, e.g. as if the reaction had been allowed to continue uninterrupted.

Claim 1 recites a method comprising: operating a process using a catalytic reactor system comprising a catalyst, *see, e.g.*, Application at ¶ 28, lines 1-13, whereby the process produces at least one hazardous substance, *see, e.g.*, Application at ¶ 21, lines 1-14; discontinuing operation of the process, *see, e.g.*, Application at ¶ 32, lines 1-13; and abating the at least one hazardous

substance from the catalytic reactor system, *see, e.g.*, Application at ¶ 35, lines 1-33, while preserving activity of the catalyst contained therein, *see, e.g.*, Application at ¶ 41, lines 1-11.

Claim 24 recites a method comprising: oxidizing a catalytic reactor system at a temperature of from about 350° F to about 500° F to abate at least one hazardous substance from the catalytic reactor system, *see, e.g.*, Application at ¶ 35, lines 1-33, wherein a time required to perform the oxidation is at least about 50% less than a time required for complete regenerative oxidation of the catalytic reactor system, *see, e.g.*, Application at ¶ 43, lines 1-21.

Claim 26 recites a method comprising: operating a process using a catalytic reactor system comprising a catalyst, *see, e.g.*, Application at ¶ 28, lines 1-13, whereby the process produces at least one hazardous substance, *see, e.g.*, Application at ¶ 21, lines 1-14; discontinuing operation of the process, *see, e.g.*, Application at ¶ 32, lines 1-13; abating the at least one hazardous substance from the catalytic reactor system, *see, e.g.*, Application at ¶ 35, lines 1-33, such that a fouling rate of the catalyst is substantially the same before and after the abating, *see, e.g.*, Application at ¶ 42, lines 1-11; and restarting operation of the process using the catalyst, *see, e.g.*, Application at ¶ 29, lines 1-24.

Claim 27 recites a method comprising: oxidizing a catalytic reactor system at a temperature of from about 350° F to about 500 °F, *see, e.g.*, Application at ¶ 35, lines 1-33; monitoring abatement of at least one hazardous substance within the catalytic reactor system, *see, e.g.*, Application at ¶ 34, lines 1-23; and controlling the oxidation in response to the monitoring such that an activity of a catalyst contained therein as measured by T-eq after the oxidizing is within about 20°F of the catalyst activity before the oxidizing, *see, e.g.*, Application at ¶ 40, lines 1-24, and the at least one hazardous substance is oxidized to a safe exposure level, *see, e.g.*, Application at ¶ 35, lines 1-33.

VI. GROUND FOR REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 1-5, 10-13, 17-19, 21, 22, 26, and 29-33 are anticipated by U.S. Patent 5,895,636 (*Nguyen*) under 35 U.S.C. § 102(b).
2. Whether claims 1-33 are unpatentable over *Nguyen* under 35 U.S.C. § 103(a).

VII. ARGUMENT

A. To anticipate or render obvious the pending claims, *Nguyen* must disclose all of the elements of the claimed invention.

Claims 1-5, 10-13, 17-19, 21, 22, 26, and 29-33 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Nguyen*. In addition, claims 1-33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Nguyen*. “A claim is anticipated only if **each and every element** as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Likewise, an obviousness determination begins with a finding that **“the prior art as a whole in one form or another contains all” of the elements of the claimed invention**. See *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 22 (U.S. 1966). The Appellants respectfully submit that *Nguyen* fails to disclose all of the elements of claims 1-33, and therefore does not anticipate claims 1-5, 10-13, 17-19, 21, 22, 26, and 29-33 or render claims 1-33 obvious.

B. The Examiner must consider all of the claimed structural and functional limitations.

In considering the patentability of the claims, the Examiner must consider all of the claimed structural and functional limitations. The Examiner contends: “Regarding claims 14-16, apparatus limitations are not given undue weight in process claims.” *Office Action*, p. 4. Thus, the Examiner’s position regarding claims 14-16 is that apparatus limitations should not be given patentable weight in a process claim. Such a position is contrary to the patent laws. Specifically, one of the cornerstones of patent law is that **“all** words in a claim must be considered in judging the patentability of that claim against the prior art.” *In re Wilson*, 424 F.2d 1382, 1385, 165

USPQ 494,496 (CCPA 1970) (emphasis added); *see also* MPEP § 2143.03. In addition, MPEP § 2106.IV.B states:

[A] claimed invention may be a combination of devices that appear to be directed to a machine and one or more steps of the functions performed by the machine. **Such instances of mixed attributes**, although potentially confusing as to which category of patentable subject matter the claim belongs, **does not affect the analysis to be performed by USPTO personnel. Note that an apparatus claim with process steps is not classified as a “hybrid” claim; instead, it is simply an apparatus claim including functional limitations.** *See, e.g., R.A.C.C. Indus. v. Stun-Tech, Inc.*, 178 F.3d 1309 (Fed. Cir. 1998) (unpublished).

(Emphasis added). Thus, to the extent that the claims contain a combination of structural and functional limitations, the Examiner is required to give patentable consideration to both the functional and structural limitations in the claims.

C. Overview of *Nguyen*

Nguyen discloses a catalytic waste gas conversion process. Specifically, *Nguyen* discloses a catalyst system that converts a waste gas stream comprising relatively harmful organic compounds, such as benzene, into comparatively innocuous compounds, such as carbon dioxide and water:

This invention relates to catalytic compositions and methods for treating gas streams containing at least one carbonaceous compound including compounds selected from organic compounds and/or carbon monoxide and at least one halogen-containing compound, particularly halogenated organic compounds.

Nguyen, col. 4, ll. 28-33.

Processes of this invention, using either the single or dual bed designs, effectively treat, by catalytic reaction gaseous non-halogenated aliphatic and cyclic organic compounds including alkanes, alkenes and hetero compounds. Specific examples of such compounds commonly found in the waste gas streams of industrial processes include benzene, toluene, xylenes, phenol, ethyl alcohol, methyl acetate, methyl formate, isopropyl amine, butyl phthalate, aniline, formaldehyde, methyl ethyl ketone, acetone, etc.

Nguyen, col. 8, l. 66 – col. 9, l. 7.

[A]t least some of the organic compounds and/or carbon monoxide contained in the introduced gas stream are converted in the presence of oxygen to comparatively innocuous compounds, such as CO₂ and H₂O using the catalysts and methods of the invention ... At least some of the halogenated organic compounds ... are converted to compounds such as CO₂, H₂O and halogen molecules (Cl₂, Br₂, etc.) and/or halogen acids, such as HCl, HBr, etc. The molecular halogen and halogen acids subsequently can be removed from the gas stream by conventional scrubbing technology.

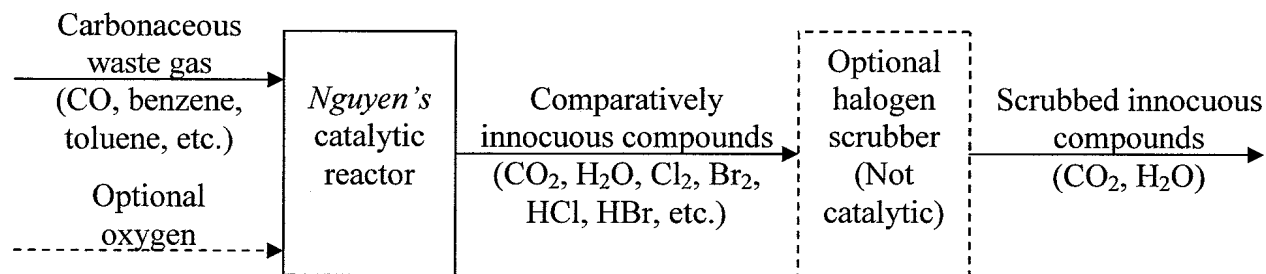
Nguyen, col. 4, ll. 52-67 (emphasis added).

Many gas streams already contain enough oxygen (O₂) to oxidize all the pollutants, and most gas streams contain a large excess. In general, a large excess of oxygen greatly facilitates the oxidation reaction. In the event that the gas stream does not contain enough oxygen, oxygen, preferably as air, may be injected into the gas stream prior to contact with the first catalyst. The minimum amount of oxygen which must be present in the gas stream is the stoichiometric amount necessary to convert the carbon and hydrogen in the compounds present to carbon dioxide and water. For convenience and to insure that the oxidation reaction goes to completion, it is desirable that an excess of oxygen be present. Accordingly, it is preferable that at least two times the stoichiometric amount and most preferably at least five times the stoichiometric amount of oxygen be present in the waste gas stream.

Nguyen, col. 9, ll. 29-44 (emphasis added).

Once the gas stream has been contacted with the catalyst and the pollutants destroyed, the catalyst treated gas stream may be further treated, if desired, to remove the halogen acid and any halogens which are formed during the conversion process. For example, the treated gas stream may be passed through a scrubber to absorb the acid. The scrubber may contain a base such as sodium or ammonium hydroxide which neutralizes the acids and solubilizes the halogens as basic [hypohalites] and halides.

Nguyen, col. 10, ll. 54-62. Thus, Nguyen's process can be illustrated by the following figure:



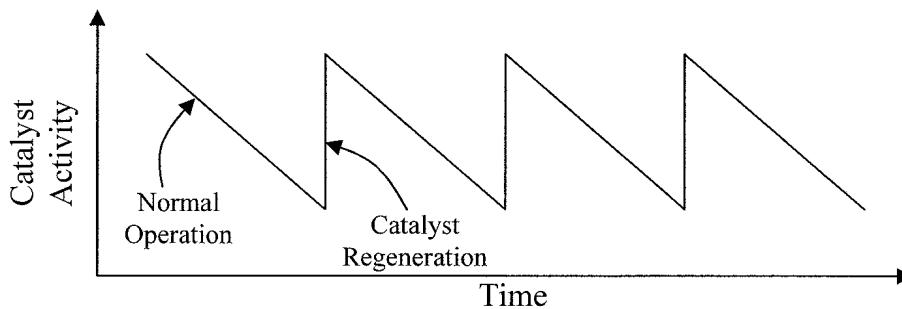
Note that *Nguyen*'s halogen scrubber uses sodium hydroxide or ammonium hydroxide to absorb the halogen and halogen acids from the catalytic reactor effluent, and thus there is only one catalytic reactor in *Nguyen*'s process.

When *Nguyen* abates the carbonaceous waste gas stream in his catalytic reactor, coke³ forms on the catalyst particles. As is well known in the art, coke tends to build up on the catalyst over time, thereby gradually reducing the catalyst activity (e.g. by blocking the catalyst's pores). When the catalyst activity reaches a minimum acceptable level, the coke must be removed from the catalyst, thereby reactivating the catalyst. *Nguyen* uses thermal regeneration to remove the coke from his catalyst:

The catalysts of the invention are active and stable. The catalysts can be thermally regenerated to remove deposits of carbonaceous coke by means well known in the art. Typically, oxygen at a temperature of about 400-450°C is introduced to the device by way of the inlet duct. **The exothermic reaction of coke combustion can increase temperatures within the catalyst bed(s) to at least about 600°C. The catalysts of the invention and the activity of the catalysts is substantially unaffected by successive regeneration treatments.**

Nguyen, col. 10, l. 63 – col. 11, l. 5 (emphasis added). As shown above, *Nguyen* discloses that his catalyst bed is regenerated at a temperature of at least about 600°C and that such regeneration does not substantially affect his catalyst. In other words, each time *Nguyen* regenerates his catalyst to remove the coke, the catalyst returns to its original activity level. Thus, the following graph illustrates *Nguyen*'s catalyst activity over time:

³ The International Union of Pure and Applied Chemistry (IUPAC) defines coke as “a solid high in content of the element carbon and structurally in the non-graphitic state. It is produced by pyrolysis of organic matter which has passed, at least in part, through a liquid or liquid-crystalline state during the carbonization process. Coke can contain mineral matter.” IUPAC Compendium of Chemical Terminology, 2nd Ed. (1997). The IUPAC dictionary is available online at <http://old.iupac.org/publications/compendium/index.html>.



In summary, *Nguyen* discloses a catalytic process that converts harmful carbonaceous compounds, such as carbon monoxide and benzene, into relatively harmless compounds, such as carbon dioxide and water. In doing so, *Nguyen* requires at least a stoichiometric amount of oxygen in the reactor. Finally, *Nguyen* periodically regenerates his catalyst back to the original activity level by burning off the coke deposits.

D. *Nguyen* does not produce a hazardous substance in a catalytic reactor and then abate the hazardous substance from the same catalytic reactor.

Nguyen fails to anticipate claims 1-5, 10-13, 17-19, 21, 22, 26, and 30-33 or render claims 1-23, 26, and 29-33 obvious because *Nguyen* fails to produce a hazardous substance in a catalytic reactor and then abate the hazardous substance from the same catalytic reactor. Claims 1 and 26 read:

1. A method comprising:
 - operating a process using a catalytic reactor system comprising a catalyst, whereby the process produces at least one hazardous substance;
 - discontinuing operation of the process; and
 - abating the at least one hazardous substance from the catalytic reactor system while preserving activity of the catalyst contained therein.
26. A method comprising:
 - operating a process using a catalytic reactor system comprising a catalyst, whereby the process produces at least one hazardous substance;
 - discontinuing operation of the process;
 - abating the at least one hazardous substance from the catalytic reactor system such that a fouling rate of the catalyst is substantially the same before and after the abating; and
 - restarting operation of the process using the catalyst.

As shown above, claims 1 and 26 recite the production of a hazardous substance in a catalytic reactor and then the abatement of the hazardous substance from the same catalytic reactor. While *Nguyen* abates the hazardous substance in his catalytic reactor, he does not produce the hazardous substance in the same reactor in which he abates the hazardous substance. Specifically, *Nguyen* discloses that his process converts the hazardous waste gas stream into comparatively innocuous compounds. See *Nguyen*, col. 4, ll. 52-67. *Nguyen* does not provide any details of how the hazardous waste gas stream is produced, and **there is no evidence that the hazardous waste gas stream is produced using the same catalytic reactor that is used to abate the hazardous waste gas stream.** The Examiner argues that the waste gas treated by *Nguyen*'s process "are produced by industrial processes (paragraph bridging columns 9-10), which would include catalytic processes in industry." *Office Action*, pp. 4-5. **Even if the waste gas treated by *Nguyen*'s process is produced in a catalytic reactor, it is not produced in the same catalytic reactor in which it is abated.** As such, *Nguyen* fails to disclose a limitation of claims 1 and 26. Consequently, claims 1-5, 10-13, 17-19, 21, 22, 26, and 30-33 are not anticipated by *Nguyen*, and claims 1-23, 26, and 29-33 are not rendered obvious by *Nguyen*.

E. *Nguyen*'s oxidation time is not at least about 50% less than his regeneration time.

Nguyen fails to render claims 24 and 25 obvious because *Nguyen* fails to disclose that the oxidation time is at least about 50% less than the regeneration time. Claim 24 reads:

24. A method comprising:
oxidizing a catalytic reactor system at a temperature of from about 350° F to about 500° F to abate at least one hazardous substance from the catalytic reactor system,
wherein **a time required to perform the oxidation is at least about 50% less than a time required for complete regenerative oxidation** of the catalytic reactor system.

As shown above, claim 24 recites the limitation that the oxidation time is at least about 50% less than the regeneration time. **Nguyen does not disclose his oxidation time or his regeneration time.** Lacking such disclosure, *Nguyen* cannot disclose that his oxidation time is at least about 50% less than the regeneration time. Moreover, a reactor's operation time vastly exceeds the reactor's regeneration time in most, if not all, catalytic reactors. Specifically, regeneration time is "downtime" in that the reactor is not being used to produce the desired product. Thus, it is desirable to minimize regeneration time, and thereby maximize production time and process economics. Therefore, *Nguyen's* oxidation time likely vastly exceeds his regeneration time. If *Nguyen's* oxidation time exceeds his regeneration time, then *Nguyen's* oxidation time is not at least about 50% less than the regeneration time. As such, *Nguyen* fails to disclose a limitation of claim 24, and consequently claims 24 and 25 are not rendered obvious by *Nguyen*.

F. *Nguyen* does not control the abatement/oxidation such that the T-eq after the abatement/oxidation is within about 20°F of the T-eq before the abatement/oxidation.

In addition to the reasons provided in section VII.D above, *Nguyen* fails to render claims 11, 27, and 28 obvious because *Nguyen* fails to control the abatement/oxidation such that the T-eq after the abatement/oxidation is within about 20°F of the T-eq before the abatement/oxidation. Claims 11 and 27 read:

11. The method of claim 10, **wherein the catalyst activity as measured by T-eq after the abatement is within about 20° F of the catalyst activity before the abatement.**

27. A method comprising:
oxidizing a catalytic reactor system at a temperature of from about 350° F to about 500 °F;
monitoring abatement of at least one hazardous substance within the catalytic reactor system; and
controlling the oxidation in response to the monitoring such that an activity of a catalyst contained therein as measured by T-eq after the oxidizing is within about 20°F of the catalyst activity before the oxidizing and the at least one hazardous substance is oxidized to a safe exposure level.

As shown above, claims 11 and 27 recite controlling the abatement/oxidation such that the T-eq after the abatement/oxidation is within about 20°F of the T-eq before the abatement/oxidation. In contrast, **Nguyen does not disclose the difference in his temperature before and after abatement/oxidation.** While *Nguyen* discloses that his catalytic reactor abates the hazardous substance at a temperature of from about 100°C to about 650°C, preferably 150°C to about 450°C, and that such oxidation is only stopped to regenerate the catalyst (*see Nguyen*, col. 8, ll. 60-64 and col. 10, l. 63 – col. 11, l. 5), he never discloses the conditions that trigger catalyst regeneration, such as conversion rate drop, T-eq increase, etc. *Nguyen's* lack of disclosure regarding his temperature drop during his oxidation process is insufficient to disclose the claimed limitation of controlling the abatement/oxidation such that the T-eq after the abatement/oxidation is within about 20°F of the T-eq before the abatement/oxidation. As such, *Nguyen* fails to disclose a limitation of claims 11, 27, and 28, and consequently claims 11, 27, and 28 are not rendered obvious by *Nguyen*.

G. *Nguyen* does not have an oxygen concentration of from about 0.005 mol% to about 5 mol% during abatement.

In addition to the reasons provided in section VII.D above, *Nguyen* fails to anticipate or render claim 32 obvious because *Nguyen* fails to disclose an oxygen concentration of from about 0.005 mol% to about 5 mol% during abatement. Claim 32 reads:

32. The method of claim 1, wherein the oxygen concentration in the catalytic reactor system during the abating is from about 0.005 mol% to about 5 mol%.

As shown above, claim 32 recites an oxygen concentration of from about 0.005 mol% to about 5 mol% during abatement. In contrast, *Nguyen* teaches that at least a stoichiometric amount of oxygen (and preferably much more) must be present in his catalytic reactor. See *Nguyen*, col. 9, ll. 29-44. The stoichiometric amount of oxygen required for conversion of *Nguyen's* waste gas compounds into carbon dioxide and water is shown in the following table:

Waste Gas Compound	Reaction Equation	Moles O ₂ per Mole of Waste Gas Compound	Minimum O ₂ Molar %age
Carbon Monoxide	$\text{CO} + \frac{1}{2} \text{O}_2 \rightarrow \text{CO}_2$	0.5	33.3
Benzene	$\text{C}_6\text{H}_6 + 15/2 \text{O}_2 \rightarrow 6\text{CO}_2 + 3\text{H}_2\text{O}$	7.5	88.2
Toluene	$\text{C}_7\text{H}_8 + 9 \text{O}_2 \rightarrow 7\text{CO}_2 + 4\text{H}_2\text{O}$	9	90.0
Xylene	$\text{C}_8\text{H}_{10} + 21/2 \text{O}_2 \rightarrow 8\text{CO}_2 + 5\text{H}_2\text{O}$	10.5	91.3
Phenol	$\text{C}_6\text{H}_5\text{OH} + 7\text{O}_2 \rightarrow 6\text{CO}_2 + 3\text{H}_2\text{O}$	7	87.5
Ethyl Alcohol	$\text{C}_2\text{H}_6\text{O} + 3\text{O}_2 \rightarrow 2\text{CO}_2 + 3\text{H}_2\text{O}$	3	75.0
Methyl Acetate	$\text{C}_3\text{H}_6\text{O}_2 + 7/2 \text{O}_2 \rightarrow 3\text{CO}_2 + 3\text{H}_2\text{O}$	3.5	77.8
Methyl Formate	$\text{HCOOCH}_3 + 2\text{O}_2 \rightarrow 2\text{CO}_2 + 2\text{H}_2\text{O}$	2	66.7
Isopropyl Amine	$2\text{C}_3\text{H}_9\text{N} + 23/2 \text{O}_2 \rightarrow 6\text{CO}_2 + 9\text{H}_2\text{O} + 2\text{NO}^4$	5.75	85.2
Butyl Phthalate	$\text{C}_{16}\text{H}_{22}\text{O}_4 + 39/2 \text{O}_2 \rightarrow 16\text{CO}_2 + 11\text{H}_2\text{O}$	19.5	95.1
Formaldehyde	$\text{CH}_2\text{O} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$	1	50.0
Methyl Ethyl Ketone	$\text{C}_4\text{H}_8\text{O} + 11/2 \text{O}_2 \rightarrow 4\text{CO}_2 + 4\text{H}_2\text{O}$	5.5	84.6
Acetone	$\text{C}_3\text{H}_6\text{O} + 4\text{O}_2 \rightarrow 3\text{CO}_2 + 3\text{H}_2\text{O}$	4	80.0

⁴ Oxidation of isopropyl amine will yield CO₂, H₂O, and NO_x, where x is dependent on the amount of oxygen in the reactor. NO is used in this equation because it yields the lowest possible O₂ molar feed percentage.

As shown in the above table, *Nguyen*'s process requires at least 33 mol% oxygen in his catalytic reactor to oxidize his waste gas. **33 mol% oxygen exceeds the claimed oxygen concentration of from about 0.005 mol% to about 5 mol%.** As such, *Nguyen* fails to disclose a limitation of claim 32, and consequently claim 32 is not anticipated or rendered obvious by *Nguyen*.

H. *Nguyen* does not reduce his system's pressure to about 15 psig to evolve any remaining hazardous substances.

In addition to the reasons provided in section VII.D above, *Nguyen* fails to render claim 29 obvious because *Nguyen* fails to reduce his system's pressure to about 15 psig to evolve any remaining hazardous substances. Claim 29 reads:

29. The method of claim 8, further comprising gradually **reducing the system pressure to about 15 psig to evolve any remaining hazardous substances,** wherein the system pressure is reduced after the at least some of the hazardous substance is abated to a safe exposure level.

As shown above, claim 29 recites the reduction of the system pressure to about 15 psig to evolve any remaining hazardous substances. ***Nguyen* does not disclose any pressure changes for his system, and certainly does not disclosure a pressure reduction to evolve any remaining hazardous substances.** In fact, *Nguyen*'s only mention of pressure is that his reactor "may be designed to be subjected to operating pressures of ambient pressure (0 psig) to greater than 300 psig." *Nguyen*, col. 11, ll. 13-15. However, such operating pressures are insufficient to disclose the claimed limitation of reducing the system pressure to about 15 psig to evolve any remaining hazardous substances. As such, *Nguyen* fails to disclose a limitation of claim 29, and consequently claim 29 is not rendered obvious by *Nguyen*.

I. *Nguyen* does not dump and screen his catalyst.

In addition to the reasons provided in section VII.D above, *Nguyen* fails to render claim 20 obvious because *Nguyen* fails to disclose dumping and screening of his catalyst. Claim 20 reads:

20. The method of claim 1, further comprising **dumping and screening the catalyst** subsequent to abating.

As shown above, claim 20 recites the dumping and screening of the catalyst. ***Nguyen* does not disclose dumping and screening of his catalyst.** In fact, *Nguyen* states that his catalyst is unaffected by his successive regeneration treatments. See *Nguyen*, col. 11, ll. 3-5. If *Nguyen*'s catalyst is unaffected by his successive regeneration treatments, then there is no need for his to remove his catalyst from his reactor, and therefore no need for him to dump and screen his catalyst. As such, *Nguyen* fails to disclose a limitation of claim 20, and consequently claim 20 is not rendered obvious by *Nguyen*.

J. *Nguyen* does not replace his catalyst.

In addition to the reasons provided in section VII.D above, *Nguyen* fails to anticipate or render claim 21 obvious because *Nguyen* fails to disclose replacement of the catalyst. Claim 21 reads:

21. The method of claim 1, further comprising **replacing the catalyst** subsequent to abating.

As shown above, claim 21 recites the replacement of the catalyst. ***Nguyen* does not disclose replacement of his catalyst.** In fact, *Nguyen* states that his catalyst is unaffected by his successive regeneration treatments. See *Nguyen*, col. 11, ll. 3-5. If *Nguyen*'s catalyst is unaffected by his successive regeneration treatments, then there is no need for his to remove his catalyst from his reactor, and therefore no need for him to replace his catalyst. As such, *Nguyen*

fails to disclose a limitation of claim 21, and consequently claim 21 is not anticipated or rendered obvious by *Nguyen*.

K. *Nguyen* does not reclaim metal from his catalyst.

In addition to the reasons provided in section VII.D above, *Nguyen* fails to anticipate or render claim 22 obvious because *Nguyen* fails to reclaim metal from his catalyst. Claim 22 reads:

22. The method of claim 21, further comprising **reclaiming metal from the catalyst**.

As shown above, claim 22 recites the reclamation of metal from the catalyst. *Nguyen* does not disclose reclaiming metal or doing anything other than his oxidation process with his catalyst. In fact, metal is typically only reclaimed from the catalyst after the catalyst is spent. Recall that *Nguyen* states that his catalyst is unaffected by his successive regeneration treatments. See *Nguyen*, col. 11, ll. 3-5. If *Nguyen*'s catalyst is unaffected by his successive regeneration treatments, then his catalyst will never be spent, and therefore no need for him to reclaim metal from his catalyst. As such, *Nguyen* fails to disclose a limitation of claim 22, and consequently claim 22 is not anticipated or rendered obvious by *Nguyen*.

L. *Nguyen* does not reload his catalyst.

In addition to the reasons provided in section VII.D above, *Nguyen* fails to render claim 23 obvious because *Nguyen* fails to reload his catalyst. Claim 23 reads:

23. The method of claim 20, further comprising **reloading the catalyst** subsequent to dumping and screening.

As shown above, claim 23 recites the reloading of the catalyst. *Nguyen* does not disclose reloading his catalyst. In fact, *Nguyen* states that his catalyst is unaffected by his successive regeneration treatments. See *Nguyen*, col. 11, ll. 3-5. If *Nguyen*'s catalyst is unaffected by his

successive regeneration treatments, then there is no need for his to remove his catalyst from his reactor, and therefore no need for him to reload his catalyst. As such, *Nguyen* fails to disclose a limitation of claim 23, and consequently claim 23 is not rendered obvious by *Nguyen*.

VIII. CONCLUSION

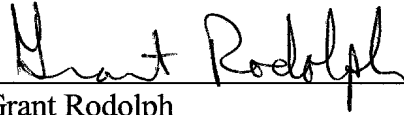
In view of the above arguments, the Appellants respectfully request that the final rejection of the claims be reversed and the case advanced to issue. If the Examiner feels that a telephone interview would advance prosecution of the instant application, then the Appellants invite the Examiner to call the attorneys of record.

The Commissioner is hereby authorized to charge payment of any further fees associated with any of the foregoing papers submitted herewith, or to credit any overpayment thereof, to Deposit Account No. 50-1515, of Conley Rose, P.C. of Texas.

Respectfully submitted,
CONLEY ROSE, P.C.

Date: 2/16/09

5601 Granite Parkway, Suite 750
Plano, Texas 75024
Telephone: (972) 731-2288
Facsimile: (972) 731-2289


Grant Rodolph
Reg. No. 50,487

ATTORNEY FOR APPELLANTS

IX. CLAIMS APPENDIX

The text of the claims involved in the appeal is:

1. A method comprising:

operating a process using a catalytic reactor system comprising a catalyst, whereby the process produces at least one hazardous substance;

discontinuing operation of the process; and

abating the at least one hazardous substance from the catalytic reactor system while preserving activity of the catalyst contained therein.

2. The method of claim 1, wherein the abatement comprises an oxidation of the at least one hazardous substance.

3. The method of claim 2, wherein the oxidation of the at least one hazardous substance occurs at a temperature of from about 350° F to about 500° F.

4. The method of claim 1, wherein the at least one hazardous substance is abated to a safe exposure level.

5. The method of claim 1, wherein the at least one hazardous substance comprises benzene.

6. The method of claim 2, further comprising monitoring an amount of the at least one hazardous substance and controlling the oxidation of the at least one hazardous substance in response thereto.

7. The method of claim 6, wherein the monitoring the at least one hazardous substance further comprises obtaining samples at an inlet and an outlet of the catalytic reactor system.
8. The method of claim 6, wherein the at least one hazardous substance is abated to a safe exposure level.
9. The method of claim 6, wherein the at least one hazardous substance comprises benzene, and the benzene is abated to an amount less than about 1 ppmv.
10. The method of claim 1, wherein the catalyst activity is substantially the same before and after the abatement.
11. The method of claim 10, wherein the catalyst activity as measured by T-eq after the abatement is within about 20° F of the catalyst activity before the abatement.
12. The method of claim 1, wherein the catalyst activity as measured by T-eq before the abatement is at least about 30° F below an end-of-cycle T-eq.
13. The method of claim 1, wherein a fouling rate as measured by change in T-eq per week increases by no more than about 30% after the abatement.
14. The method of claim 1, wherein the catalytic reactor system is a fixed bed reactor system.

15. The method of claim 1, wherein the catalytic reactor system is a reforming reactor system.
16. The method of claim 15, wherein the reforming reactor system comprises a plurality of reactors.
17. The method of claim 1, wherein the catalyst is a reforming catalyst.
18. The method of claim 1, wherein the catalyst is a platinum catalyst.
19. The method of claim 1, wherein the catalyst has one or more cycles of catalyst activity.
20. The method of claim 1, further comprising dumping and screening the catalyst subsequent to abating.
21. The method of claim 1, further comprising replacing the catalyst subsequent to abating.
22. The method of claim 21, further comprising reclaiming metal from the catalyst.
23. The method of claim 20, further comprising reloading the catalyst subsequent to dumping and screening.

24. A method comprising:

oxidizing a catalytic reactor system at a temperature of from about 350° F to about 500° F to abate at least one hazardous substance from the catalytic reactor system,

wherein a time required to perform the oxidation is at least about 50% less than a time required for complete regenerative oxidation of the catalytic reactor system.

25. The method of claim 24, wherein the at least one hazardous substance is abated to a safe exposure level.

26. A method comprising:

operating a process using a catalytic reactor system comprising a catalyst, whereby the process produces at least one hazardous substance;

discontinuing operation of the process;

abating the at least one hazardous substance from the catalytic reactor system such that a fouling rate of the catalyst is substantially the same before and after the abating; and

restarting operation of the process using the catalyst.

27. A method comprising:

oxidizing a catalytic reactor system at a temperature of from about 350° F to about 500 °F;

monitoring abatement of at least one hazardous substance within the catalytic reactor system; and

controlling the oxidation in response to the monitoring such that an activity of a catalyst contained therein as measured by T-eq after the oxidizing is within about 20°F of the catalyst activity before the oxidizing and the at least one hazardous substance is oxidized to a safe exposure level.

28. The method of claim 27, wherein the oxidation is stopped before regenerating the catalyst in order to preserve catalyst life.

29. The method of claim 8, further comprising gradually reducing the system pressure to about 15 psig to evolve any remaining hazardous substances, wherein the system pressure is reduced after the at least some of the hazardous substance is abated to a safe exposure level.

30. The method of claim 1, further comprising: regenerating the catalyst subsequent to abating.

31. The method of claim 1, further comprising: removing hydrocarbons from the catalytic reactor system subsequent to discontinuing and prior to abating.

32. The method of claim 1, wherein the oxygen concentration in the catalytic reactor system during the abating is from about 0.005 mol% to about 5 mol%.

33. The method of claim 1, further comprising: restarting operation of the process using the catalyst.

X. EVIDENCE APPENDIX

None.

XI. RELATED PROCEEDINGS APPENDIX

None.